

Date: Monday, 7/16/2007 2:46:19 PM
 User: Kim Johnston

Process Sheet

Customer : CU-DAR001 Dart Helicopters Services	Drawing Name : 02.750 SUPPORT
Job Number : 33560	
Estimate Number : 10829	
P.O. Number :	Part Number : D28931
This Issue : 7/16/2007 S.O. No. :	Drawing Number : D2893 REV B
Prsht Rev. : NC	Project Number : N/A
First Issue : 11 Type : MACHINED PARTS	Drawing Revision : B
Previous Run : 32779	Material :
Written By : <u>JA</u>	Due Date : 7/30/2007 Qty: 12 Um: Each
Checked & Approved By : <u>JA 07.07.17</u>	
Comment : Est: 002.11.26 Reformat; Added P/O KJ	
est D 06.04.19 removed alodine EC	
Est Rev:E Added priming as per Rev B 07-04-30 JLM	

Additional Product

Job Number:



Seq. #: Machine Or Operation: Description :

1.0 PG

PURCHASING



Comment: PURCHASING

Issue P/O: 4217

Description: D6104-005

Material: 17-4 PH SS (AMS 5643 OR AISI 630) as per Dwg D6104

Material release note required.

C 207107119

(12)

2.0

D6104005

17-4 SS Roundbar 4.00"OD



Comment: Qty.: 1.0000 Each(s)/Unit Total : 12.0000 Each(s)
 Support

3.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Recieve & Inspect for Transit Damage

Ensure Material Release Note is attached

7/7/30 SP

4.0

MORI SEIKI

MORI SEIKI CNC LATHE LARGE



(P.O)

Comment: MORI SEIKI CNC LATHE LARGE

Turn blank for Haas as per Folio FA081

2.5 07/09/03

(12)

Date: Monday, 7/16/2007 2:46:19 PM
User: Kim Johnston

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: 02.750 SUPPORT

Job Number: 33560

Part Number: D28931

Job Number:



Seq. # Machine Or Operation: Description :

5.0 QC2 INSPECT PARTS AS THEY COME OFF MACHINE



Comment: INSPECT PARTS AS THEY COME OFF MACHINE

S.F 07/08/05

6.0 HAAS1 HAAS CNC VERTICAL MACHINING #1



Comment: BAND SAW
Machine as per Folio FA081
Tumble & Deburr

J.L 07/08/14

PTD

Scrap 1/2

7.0 QC2 INSPECT PARTS AS THEY COME OFF MACHINE



Comment: INSPECT ALL DIM TO DIM SHEET

J.L 07/08/14

8.0 QC8 SECOND CHECK



Comment: SECOND CHECK

ML 07/08/14

9.0 POWDER COATING POWDER COATING



Comment: POWDER COATING
Powder Coat White Gloss (Ref: 4.3.5.1) as per QSI 005 4.3
Mask Inside Bore for Priming

M 105 068

BR/ML 07-08-14

12

10.0 SPRAY PAINTING SPRAY PAINTING



Comment: SPRAY PAINTING

Prime inside surface as per Dwg D2893 and QSI 005 4.3.

ML 07 08 14

12

11.0 QC3 INSPECT POWDER COAT/CHEMICAL CONVERSION



Comment: INSPECT POWDER COAT

ST 07/08/15

12.0 PACKAGING 1 PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Identify and Stock

Location: *outside Paint Booth*

ST 07-08-15

23

Date: Monday, 7/16/2007 2:46:20 PM
User: Kim Johnston

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: 02.750 SUPPORT

Job Number: 33560

Part Number: D28931

Job Number:



Seq. #:

Machine Or Operation:

Description :

13.0

QC21

FINAL INSPECTION/W/O RELEASE



Comment: FINAL INSPECTION/W/O RELEASE

07-08-15

Job Completion



07-08-15

DART AEROSPACE LTD	Work Order: 33560
Description: Ø2.750 Support	Part Number: D2893-1
Inspection Dwg: D2893 Rev. B	Page 1 of 1

Inspect dimensions highlighted on inspection sheet drawing D2893 Rev B / DSK078 Rev A and record below:

				Recorded Actual Dimensions					
Dim	Min	Max	Go/No Go Gauge	1	2	3	4	By	Date
Lathe Section									
A	2.707	2.712		2.719	2.712	2.710	2.710		
B	4.946	4.966		4.925	4.961	4.954	4.955		
C	3.064	3.084		3.070	3.067	3.078	3.078		
D	0.718	0.738		.7285	.728	.728	.729		
E	0.090	0.110		.099	.102	.100	.101		
F	2.934	2.954		2.941	2.936	2.948	2.947		
G	2.166	2.186		2.174	2.174	2.172	2.174		
H	3.890	3.910		3.901	3.901	3.901	3.900		
I	0.914	0.934		.928	.928	.930	.933		
J	0.022	0.042		.032	.032	.032	.032		
K	0.109	0.129		.116	.116	.116	.116		
L									
HAAS Section									
AA	2.985	3.005		2.992	2.990	2.990	2.990		
AB	0.440	0.460		.440	.440	.440	.440		
AC	0.125	0.160		.141	.135	.142	.140		
AD	0.040	0.060		.043	.042	.044	.044		
AE	0.188	0.193		.190	.190	.190	.190		
AF	0.125	0.160		.141	.143	.142	.142		
AG	0.140	0.160		.156	.160	.155	.156		
AH	1.360	1.400		1.369	1.371	1.372	1.373		
AI	0.040	0.060		.044	.048	.054	.056		
AJ	1.190	1.230		1.210	1.210	1.215	1.220		
AK	0.010	0.020		.015	.015	.015	.015		
AL	0.053	0.073		.063	.063	.063	.063		
AM	0.240	0.260		.250	.250	.250	.250		
AN	2.518	2.538		2.524	2.529	2.524	2.528		
AO	84.39	90.39							
AP	0.261	0.266		.262	.262	.262	.262		
AQ	0.053	0.073		.063	.063	.063	.063		
AR									
AS									
Accept/Reject				(1/2 SCRAP)					

Measured by: S.B.
Date: 07/08/04 / 07/08/14

Audited by: [Signature]
Date: 07/08/14

Rev	Date	Change	Revised by	Approved
A	02.12.13	New Issue	KJ/RF	
B	07.05.08	Dimension AP revised	KJ/JLM	[Signature]

DART AEROSPACE LTD	Work Order: 33560
Description: Ø2.750 Support	Part Number: D2893-1
Inspection Dwg: D2893 Rev. B	Page 1 of 1

Inspect dimensions highlighted on inspection sheet drawing D2893 Rev B / DSK078 Rev A and record below:

				Recorded Actual Dimensions					
Dim	Min	Max	Go/No Go Gauge	5	6	7	8	By	Date
Lathe Section									
A	2.707	2.712		2.710	2.710	2.711	2.710		
B	4.946	4.966		4.955	4.952	4.953	4.953		
C	3.064	3.084		3.078	3.078	3.077	3.077		
D	0.718	0.738		.729	.728	.729	.729		
E	0.090	0.110		.102	.102	.099	.102		
F	2.934	2.954		2.947	2.949	2.946	2.947		
G	2.166	2.186		2.174	2.172	2.174	2.174		
H	3.890	3.910		3.900	3.902	3.900	3.900		
I	0.914	0.934		.925	.920	.928	.925		
J	0.022	0.042		.032	.032	.032	.032		
K	0.109	0.129		.116	.116	.114	.115		
L									
HAAS Section									
AA	2.985	3.005		2.990	2.986	2.992	2.989		
AB	0.440	0.460		.440	.440	.440	.440		
AC	0.125	0.160		.141	.136	.130	.135		
AD	0.040	0.060		.041	.050	.053	.044		
AE	0.188	0.193		.190	.190	.190	.190		
AF	0.125	0.160		.140	.138	.140	.140		
AG	0.140	0.160		.154	.153	.155	.153		
AH	1.360	1.400		1.361	1.362	1.376	1.373		
AI	0.040	0.060		.060	.058	.053	.056		
AJ	1.190	1.230		1.195	1.195	1.223	1.217		
AK	0.010	0.020		.015	.015	.015	.015		
AL	0.053	0.073		.063	.063	.063	.063		
AM	0.240	0.260		.250	.250	.250	.250		
AN	2.518	2.538		2.530	2.530	2.530	2.530		
AO	84.39	90.39							
AP	0.261	0.266		.262	.262	.262	.262		
AQ	0.053	0.073		.063	.063	.063	.063		
AR									
AS									
Accept/Reject									

Measured by: JF
Date: 07/08/04 / 07/08/14

Audited by: [Signature]
Date: 07/08/14

Rev	Date	Change	Revised by	Approved
A	02.12.13	New Issue	KJ/RF	
B	07.05.08	Dimension AP revised	KJ/JLM	[Signature]

DART AEROSPACE LTD	Work Order:	33560
Description: Ø2.750 Support	Part Number:	D2893-1
Inspection Dwg: D2893 Rev. B		Page 1 of 1

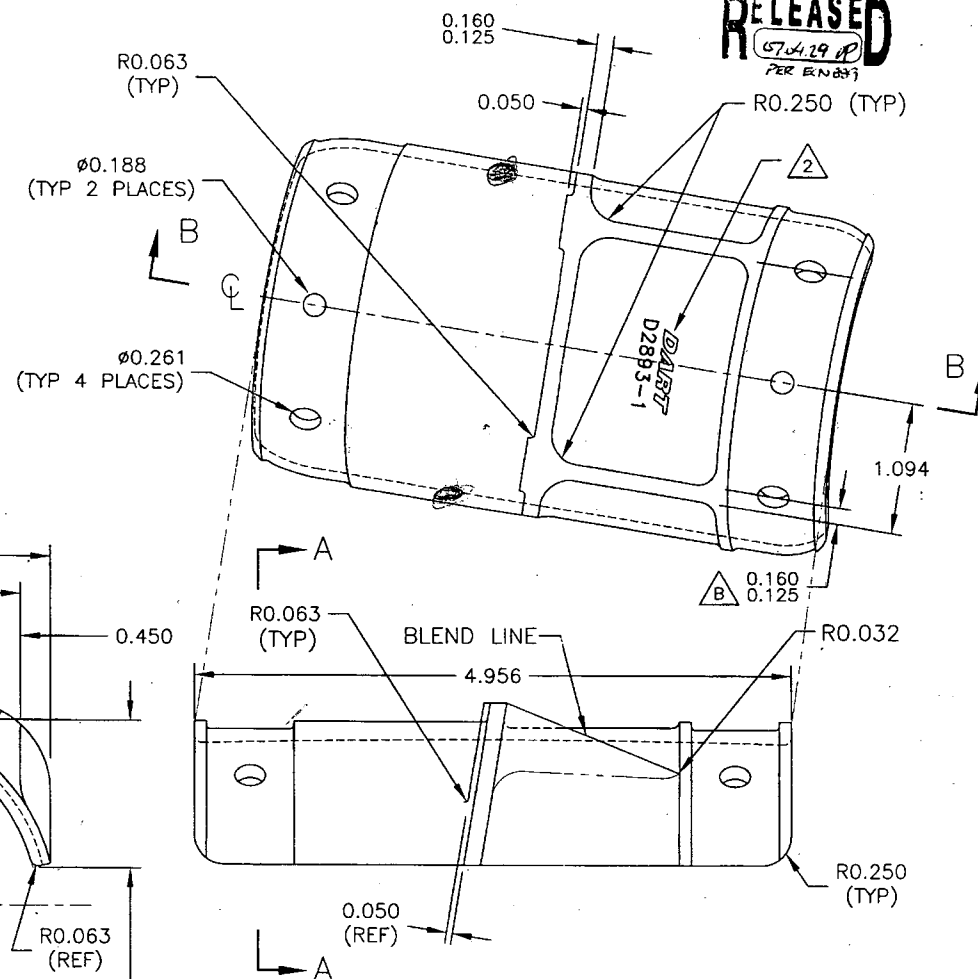
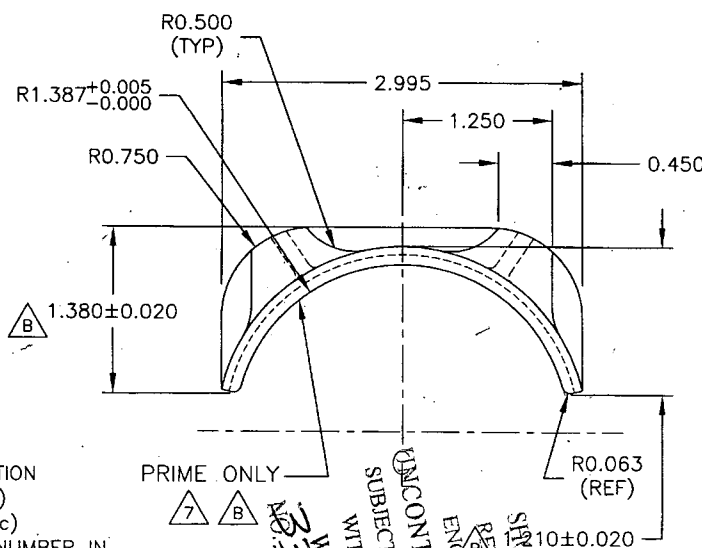
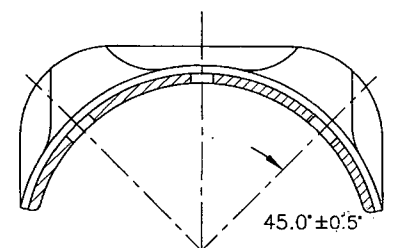
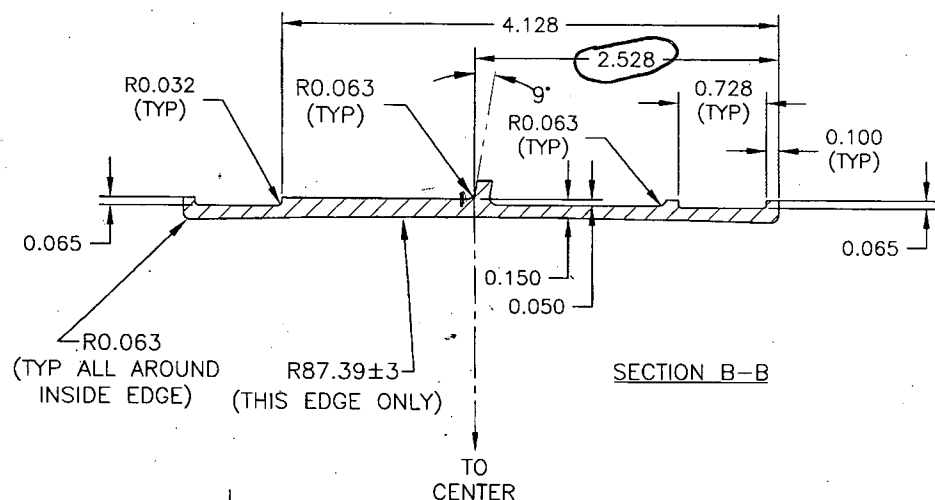
Inspect dimensions highlighted on inspection sheet drawing D2893 Rev B / DSK078 Rev A and record below:

				Recorded Actual Dimensions					
Dim	Min	Max	Go/No Go Gauge	9	10	11	12	By	Date
Lathe Section									
A	2.707	2.712		2.709	2.711	2.710	2.710		
B	4.946	4.966		4.955	4.955	4.955	4.956		
C	3.064	3.084		3.074	3.079	3.075	3.075		
D	0.718	0.738		.728	.729	.728	.730		
E	0.090	0.110		.102	.099	.103	.103		
F	2.934	2.954		2.947	2.946	2.947	2.947		
G	2.166	2.186		2.174	2.173	2.173	2.179		
H	3.890	3.910		3.903	3.899	3.900	3.900		
I	0.914	0.934		.928	.928	.927	.927		
J	0.022	0.042		.032	.032	.032	.032		
K	0.109	0.129		.114	.115	.115	.115		
L									
HAAS Section									
AA	2.985	3.005		2.992	2.992	2.991	2.991		
AB	0.440	0.460		.440	.440	.440	.440		
AC	0.125	0.160		.140	.137	.137	.135		
AD	0.040	0.060		.045	.044	.043	.043		
AE	0.188	0.193		.190	.190	.190	.190		
AF	0.125	0.160		.140	.143	.142	.142		
AG	0.140	0.160		.150	.160	.159	.157		
AH	1.360	1.400		1.3725	1.377	1.378	1.375		
AI	0.040	0.060		.052	.049	.050	.050		
AJ	1.190	1.230		1.2183	1.222	1.223	1.223		
AK	0.010	0.020		.015	.015	.015	.015		
AL	0.053	0.073		.063	.063	.063	.063		
AM	0.240	0.260		.250	.250	.250	.250		
AN	2.518	2.538		2.530	2.527	2.528	2.525		
AO	84.39	90.39							
AP	0.261	0.266		.262	.262	.262	.262		
AQ	0.053	0.073		.063	.063	.063	.063		
AR									
AS									
Accept/Reject									

Measured by:	SA
Date:	07/08/14

Audited by:	ML
Date:	07/08/14

Rev	Date	Change	Revised by	Approved
A	02.12.13	New Issue	KJ/RF	
B	07.05.08	Dimension AP revised	KJ/JLM	



D2893-1

- 1) MATERIAL: 17-4 PH STAINLESS STEEL
HEAT TREAT TO H900 CONDITION
(900°F FOR 1 HR, AIR COOL)
MIN UTS = 170 KSI (38 HRC)
- 2) IDENTIFY WITH DART LOGO AND PART NUMBER IN THIS AREA WITH 0.125 HIGH LETTERING 0.010-0.020 DEEP
- 3) BREAK ALL UNMARKED SHARP EDGES 0.010 TO 0.020
- 4) PART IS SYMMETRIC ABOUT CENTERLINE
- 5) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED
- 6) ALL DIMENSIONS ARE IN INCHES
- 7) FINISH: POWDER COAT WHITE (REF. 4.3.5.2) PER DART QSI 005 4.2
PRIME INSIDE SURFACE AS SHOWN PER DART QSI 005 4.2

WORK ORDER
133560
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SHIP COPY

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B	07.03.16	UPDATE DIMS AS MFG., PRIME INSIDE
A	01.01.10	NEW ISSUE
DESIGN	QP	DRAWN BY PH
CHECKED	#	APPROVED #
DATE	07.03.16	
DART AEROSPACE LTD. HAWKESBURY, ONTARIO, CANADA		DART
DRAWING NO. D2893		REV. B
TITLE Ø2.750 SUPPORT		SHEET 1 OF 1
		SCALE 1:1

06-25-'07 11:55 FROM-

Specialty Metals
A Division of Crucible Materials CorporationSYRACUSE
NEW YORK 13201

T-534 P010/014 F-403

CERTIFICATE OF TEST

S O L D A M CASTLE, INC		S H I P A M CASTLE, INC		OUR ORDER NO 05-11211-7-1	
T 3400 N WOLF RD O FRANKLIN PARK, IL 60131		T 26800 MILES RD O BEDFORD HEIGHTS, OH 44146		DATE 06/18/07	
CUSTOMER ORDER # & DATE 10-30989		CUSTOMER REQ. #		DISTRICT	
DESCRIPTION OF MATERIAL		B PARSONS		SHIPPED FROM SYRACUSE	

CRU 17-4PH CG A IAC 14996 SIZE 4 RD
 AMC-3174-03 REV 18 ASME-SA564-04ED T630 ASTM-A564-04 T630
 AMS-5643Q AMS-2303E A191 630 UNS #S17400

HEAT NO.

CHEMICAL ANALYSIS

A19145	C	MN	P	S	SI	NI	CR	MO	CU	CE	TO
	.039	.52	.025	.023	.66	4.09	15.24	.13	3.10	.29	.010

7/6/30 90

CASTLE METALS CORP.
 DATE RCVD 6/25/07
 IAC 14996
 APPROVED BY *LC*

QUANTITY

HEAT NO.

MECHANICAL PROPERTIES

4232 # A10945 TENSILE POI YLD. CAPSIL XELONG12 RED/AREAX HARDNESS
 CAPABILITY PHYSICALS AFTER 900 DEG. F. - 1 HR. AIRCOOL
 201,570 172,380 12.2 68.3 BHN 401

MACRO TEST UN

FERRITE 3 %

MAGNIFLUX F/S = 0/0

REDUCTION RATIO: 15.3:1

MATERIAL SOLUTION TREATED AT 1900 DEG. F. HELD 1 HOUR

AT TEMPERATURE -

AIRCOOLED.

CRUCIBLE MATERIALS CORP. VENDOR #12610

MATERIAL INGOT CAST.

NADIP - YES

MATERIAL FREE FROM MERCURY CONTAMINATION AT TIME OF SHIPMENT

NO WELD REPAIR PERFORMED

MATERIAL MELTED IN U.S.A.

THANK YOU FOR SELECTING A QUALITY PRODUCT

SWORN TO AND SUBSCRIBED BEFORE ME THIS

DAY OF _____, 20



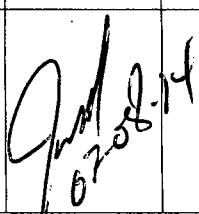
NOTARY PUBLIC

CERTIFIED
BY:

MANUFACTURED BY THE EMPLOYEES OF THE ABOVE MATERIAL WAS MANUFACTURED AND TESTED IN ACCORDANCE WITH ABOVE SPECIFICATIONS AND IS IN CONFORMANCE WITH THE SPECIFICATION REQUIREMENTS.
 CRUCIBLE MATERIALS CORPORATION
 ACTING BY AND THROUGH ITS SPECIALTY METALS DIVISION

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: D2893-1 PAR #: N/A Fault Category: Prod - CNC NCR: Yes No DQA: 1A Date: 07.08.15
 QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			
07/08/06	4.0.	The length of the support is too short. 4.925, supposed to be 4.956 ±.010 and the interior was oversize about .007" over the tolerance maximum. The code is 42.707 to 2.712. Reason IS Tools of set #7 was too big and the zero machine on the second operation was not set correctly.		ACCEPTABLE DENATIONS.	S.F. 07/08/06	N/A.	 07.08.07	
07/08/14	6.0	-1st part is scrapped, 1st operator set the origin wrong for 3rd op, only on one half of support.	PH POT 065 042	SEE ATTACHED E-MAIL FROM D. SHEPHERD	J.L 07/08/14		 07.08.14	

NOTE: Date & initial all entries

07.08.14

Peter Hum

From: David Shepherd [dshepherd@dartaero.com]
Sent: August 14, 2007 2:10 AM
To: 'Peter Hum'
Cc: 'Jason Murdoch'; 'L Lacelle'; 'Jean-Luc Menard'
Subject: RE: D2893 support deviation

Peter,

I think this part should be scrapped.
These parts are made in pairs ... is the other part OK?

David

From: Peter Hum [mailto:phum@dartaero.com]
Sent: Monday, August 13, 2007 12:45 PM
To: 'David Shepherd'
Subject: D2893 support deviation

David,

Production is making a D2893 support that goes onto the D212-664-101/-105 skidtubes.

The nominal dimension of one of the thicknesses of the bore is 0.150". On one end of the bore, the dimension measured is 0.127", there 0.023" below nominal.

See the attached sketch for details.

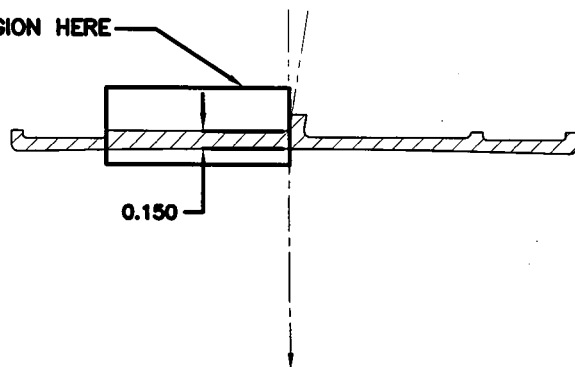
Is this an acceptable deviation?

Peter

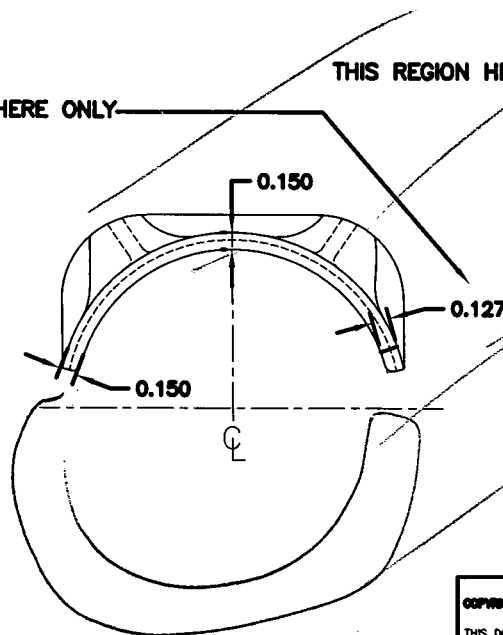
No virus found in this incoming message.
Checked by AVG Free Edition.
Version: 7.5.476 / Virus Database: 269.11.17/951 - Release Date: 8/13/2007 10:15 AM

No virus found in this outgoing message.
Checked by AVG Free Edition.
Version: 7.5.476 / Virus Database: 269.11.17/951 - Release Date: 8/13/2007 10:15 AM

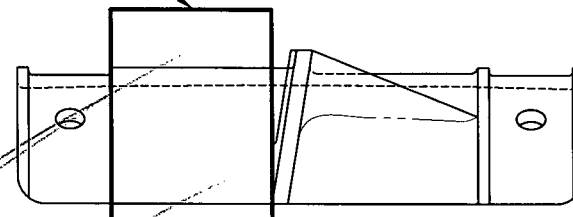
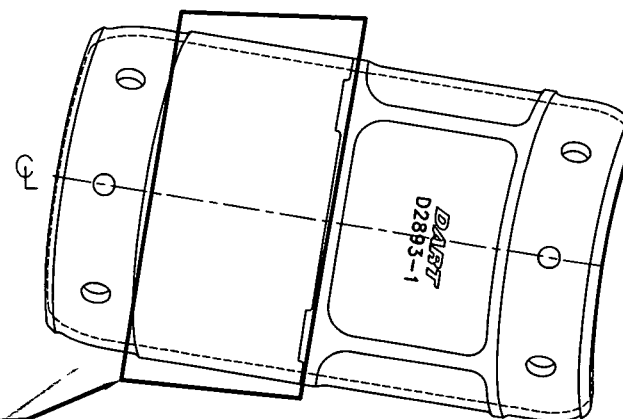
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DEVIATION HERE ONLY



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DART AEROSPACE LTD.

B	07.03.16	UPDATE DIMS AS MFG., PRIME INSIDE
A	01.01.10	NEW ISSUE
DESIGN	DRAWN BY	DART DART AEROSPACE LTD. WILKESBURY, ONTARIO, CANADA
CHECKED	APPROVED	DRAWING NO. D2893
DATE	07.03.16	TITLE ø2.750 SUPPORT
		REV. B SHEET 1 OF 1 SCALE 1:1

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes ☐ No ☒ DQA: LA Date: 07.08.15
 QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			
07-08-14	4-0	1 pair of 02893-1 supports have a minor, 0.005" deep mark on the outer edge. R.C. Mark was created during boring. Operator error.	 07.08.14	Part acceptable buff out the mark as necessary.	J.L. 07/08/14	 07-08-14	 07.08.14	 07-08-14

NOTE: Date & initial all entries